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In re Soni (CA FC) 34 USPQ2d 1684

In re Soni

U.S. Court of Appeals Federal Circuit 34 USPQ2d 1684

Decided May 9, 1995
No. 94-1372

Headnotes

PATENTS

1. Patentability/Validity -- Obviousness -- In general (§ 115.0901)

JUDICIAL PRACTICE AND PROCEDURE

Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)

Ultimate conclusion of obviousness made by Patent and Trademark Office is question of law, although underlying factual findings are reviewed for clear error; issue of whether patent applicant made showing of unexpected results is one of fact, subject to clearly erroneous standard of review.

2. Patentability/Validity -- Obviousness -- Secondary considerations generally (§ 115.0907)

Mere improvement in properties does not always suffice to show unexpected results, but applicant's showing of substantially improved results for invention, and statement that results were unexpected, should suffice to establish unexpected results absent evidence to contrary;

applicants who presented specific data demonstrating substantially improved properties for claimed conductive polymer compositions in which polymer has molecular weight greater than 150,000, and stated that such results were unexpected, therefore established unexpected results for invention in absence of contrary evidence and successfully overcame *prima facie* case of obviousness.

JUDICIAL PRACTICE AND PROCEDURE

3. Procedure -- Court of Appeals for the Federal Circuit (§ 410.03)

Procedure -- Judicial review -- Appealability (§ 410.4603)

Assertion by Patent and Trademark Office that applicants' showing of unexpected results for claimed chemical compositions is not commensurate with scope of claims cannot be considered for first time on appeal from decision by Board of Patent Appeals and Interferences upholding rejection of application claims, since new rationale cannot be applied to support rejection in appeal from board's decision.

Case History and Disposition:

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

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Patent application of Pravin L. Soni, Ceinwen Rowlands, Larry Edwards and Mark Wartenberg, serial no. 07/462,893 (conductive polymer compositions). From decision by Board of Patent Appeals and Interferences upholding examiner's rejection of claims 1-6, 8-12, and 21, applicants appeal. Reversed; Michel, J., dissenting.

Attorneys:

Herbert G. Burkard, of Raychem Corp., Menlo Park, Calif., for appellant.

Karen A. Buchanan, assistant solicitor, PTO, Nancy J. Linck, solicitor, Albin F. Drost, deputy solicitor, Harris A. Pitlick, and James T. Carmichael, for appellee.

Judge:

Before Michel, Lourie, and Bryson, circuit judges.

Opinion Text

Opinion By:

Lourie, J.

Pravin L. Soni, Ceinwen Rowlands, Larry Edwards, and Mark Wartenberg (collectively "Soni") appeal from the decision of the U.S. Patent and Trademark Office ("PTO") Board of Patent Appeals and Interferences affirming the examiner's final rejection of claims 1-6, 8-12, and 21 of application Serial No. 07/462,893, entitled "Conductive Polymer Compositions," as unpatentable on the ground of obviousness under 35 U.S.C. Section 103 (1988). Because the PTO's conclusion that unexpected results were not shown was clearly erroneous, we reverse.

BACKGROUND

The claimed invention relates to conductive polymer compositions. Claim 1 is illustrative:

1. A melt-processed composition which comprises

(i) an organic polymer which is not crosslinked and *has a molecular weight which is greater than 150,000* when measured by high temperature gel permeation chromatography, and
(ii) a particulate conductive filler which is dispersed in the polymer and which is present in [an] amount sufficient to render the composition electrically conductive (emphasis added).
Soni's patent specification states that the claimed compositions have significantly improved physical and electrical properties compared to compositions using polymers having a molecular weight below 150,000. To illustrate this point, the specification describes a number of tests comparing the properties of a composition of the invention composed of polyethylene having a molecular weight of 203,000 with a comparative composition composed of polyethylene having a molecular weight of 148,000. The data show at least a fifty-fold increase in tensile strength for the higher molecular weight composition compared to the lower molecular weight composition. The data also show at least a five-fold increase in peel strength as well as improved resistivity and recovery behavior properties. From these data, the specification concludes that "[t]he tensile, peel, resistivity behavior and recovery tests show significantly improved properties for a polymer having a molecular [weight] of 203,000 compared to one having a molecular weight of 148,000, which are much greater than would have been predicted given the difference in their molecular weights."

During prosecution, the examiner rejected the claims over the following prior art:

Rosenzweig et al. U.S. Patent 4,775,501
Soni et al. U.S. Patent 4,921,648

BNA's Intellectual Property Library on CD -- Full Text of Cases (USPQ Second Series)

Lunk et al.	U.S. Patent 4,624,990
Taylor	U.S. Patent 4,426,633
Wu et al.	U.S. Patent 4,228,118
Capaccio et al.	U.S. Patent 4,268,470
Ward et al.	U.S. Patent 3,962,205

The examiner first rejected claims 1-6, 8-12, and 21 under 35 U.S.C. Sections 102 or 103 as being anticipated by or obvious from the disclosures of the Rosenzweig or Soni patents. The examiner took the position that each of these references discloses all of the limitations recited in the claims. Second, the examiner rejected claims 1-6, 8-12, and 21 under Section 103 as being unpatentable over Lunk or Taylor, taken alone or in combination with Rosenzweig, Soni, Wu, Capaccio, or Ward. The examiner asserted that each of Lunk and Taylor discloses a melt-processed composition comprising an organic polymer and a particulate conductive filler. While acknowledging that Lunk and Taylor are silent as to the molecular weight of the polymers used, the examiner argued that a person of ordinary skill in the art would have selected a polymer having a molecular weight within the claimed range. Wu, Capaccio, and Ward were cited for their disclosures of melt-processable organic polymers having molecular weights within the claimed range. The rejections were subsequently made final, and Soni appealed to the Board. The Board affirmed the first rejection on the ground of Section 103, but reversed it with respect to Section 102. The Board found that the parent application commonly shared by Soni and

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Rosenzweig 1 did not disclose the specific molecular weight limitation found in the claims and thus the claims were not anticipated by Soni or Rosenzweig under Section 102(a) or (e). The Board found, however, that

[i]f higher molecular weight melt-processable polymers were not available at the time the parent application was filed, they certainly became available by the time of appellants' invention, as evidenced by appellants' acknowledgements in the present specification, i.e., that the compositions in the appealed claims are based on commercially available polymers. *It is also acknowledged on this record that one of ordinary skill in the relevant art would have expected higher molecular weight polymers to result in better composition properties .* See the present specification at page 17, lines 22 to 28. On this record, it would have constituted nothing more than the exercise of ordinary skill for one to have selected commercially available higher molecular weight polymers to use in the melt-processes of the references to obtain advantageous physical properties in the resulting product (emphasis added).

In response to Soni's argument that its specification describes unexpected results, the Board stated:

In the referenced portion of the present specification, it is also asserted that the improvement in properties resulting from the use of the specific class of molecular weights set forth in appellants' claims was "much greater than would have been predicted." However, *this record appears to be devoid of any evidence to support that conclusion .* Thus, *to whatever extent* it may be considered that *there is any evidence of unobviousness, it is clearly insufficient* to outweigh the evidence of obviousness of record (emphasis added).

The Board also affirmed the Section 103 rejection based on Lunk or Taylor, taken alone or in combination with the other references cited by the examiner. The Board found that Lunk would have anticipated the claimed invention except that the reference does not explicitly disclose polymers having a molecular weight greater than 150,000. The Board further found that

selection of a specific molecular weight from within the very high molecular weight class disclosed by Lunk would have been obvious to one of ordinary skill in the relevant art, and there is no convincing evidence that unobvious results are associated with the specific molecular weight limitation in question. Similarly, there is no evidence that substitution of other well-known melt-processable polymers in the Lunk composition produces unobvious results.

The Board noted that this analysis applied equally to the Taylor reference and found the remaining references essentially superfluous in view of Lunk or Taylor.

Soni requested reconsideration of the Board's decision, arguing that the Board ignored the evidence of unexpected results disclosed in the specification. On reconsideration, the Board adhered to its decision:

That which appellants characterize as "evidence" consists of conclusory statements made in the original specification concerning unpredictable differences, which statements are *unsupported by any factual data*. In a given case, this could conceivably be adequate; however, where as here the evidence of obviousness found in the references is quite strong, this type of unsupported conclusion is inadequate to outweigh it (emphasis added).

Soni now appeals.

DISCUSSION

[1] We review *de novo* the PTO's ultimate conclusion of obviousness, a question of law, although its underlying factual findings are reviewed for clear error. *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re Woodruff*, 919 F.2d 1575, 1577, 16 USPQ2d 1934, 1935 (Fed. Cir. 1990). The question whether an applicant made a showing of unexpected results is one of fact, subject to the clearly erroneous standard of review.

On appeal, Soni concedes that the prior art relied upon establishes a *prima facie* case of obviousness. Thus, the sole question for resolution is whether Soni carried its burden of rebutting the *prima facie* case of obviousness. See *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993) (*prima facie* case of obviousness shifts burden to applicant to come forward with rebuttal evidence or argument).

The references cited describe relevant compositions containing polyethylene and a conductive filler. We need not focus on the specific disclosures of the references since it is conceded that the correctness of the rejections boils down to the question whether the data in Soni's patent specification show that

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the compositions of the claims exhibit unexpectedly improved physical and electrical properties compared to lower molecular weight compositions.

Soni argues that it overcame the *prima facie* case of obviousness because its patent specification contains data showing that the claimed compositions do exhibit unexpectedly

improved properties. Soni further argues that the Board ignored these data, pointing to the Board's statements that Soni's claim of unexpected results was "unsupported by any factual evidence" and that "this record is devoid of any evidence."

In reply, the PTO maintains that Soni has not met its burden of rebutting the *prima facie* case of obviousness. Specifically, the PTO contends that the Board did in fact consider the data in Soni's specification, but found the data unpersuasive. The PTO points out that Soni's statement that the results were unexpected is conclusory and that the record lacks any evidence or explanation why the results were unexpected. The Board, the PTO notes, found that Soni had acknowledged that improved properties would have been expected for higher molecular weight compositions. The PTO contends that, because Soni did not prove, or even state, how much improvement would have been *expected*, there is no factual basis for analyzing whether Soni's data show *unexpected* results. Thus, in the PTO's view, the comparative data are entitled to little probative weight. The PTO also contends that any showing of unexpected results made by Soni was not commensurate in scope with the appealed claims.

The patent statute provides that "[a] person shall be entitled to a patent unless" any of the Section 102 or 103 bars applies. 35 U.S.C. Section 102. When a chemical composition is claimed, a *prima facie* case of obviousness under Section 103 may be established by the PTO's citation of a reference to a similar composition, the presumption being that similar compositions have similar properties. *See In re Dillon*, 919 F.2d 688, 692, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990) (*en banc*) ("structural similarity between claimed and prior art subject matter, . . . where the prior art gives reason or motivation to make the claimed compositions, creates a *prima facie* case of obviousness"), *cert. denied*, 500 U.S. 904 (1991). One way for a patent applicant to rebut a *prima facie* case of obviousness is to make a showing of "unexpected results," *i.e.*, to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected. The basic principle behind this rule is straightforward -- that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often to the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.

Consistent with the rule that all evidence of nonobviousness must be considered when assessing patentability, the PTO must consider comparative data in the specification in determining whether the claimed invention provides unexpected results. *In re Margolis*, 785 F.2d 1029, 1031, 228 USPQ 940, 941-42 (Fed. Cir. 1986). However, "[i]t is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice." *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); *see also In re Wood*, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978) ("Mere lawyer's arguments and conclusory statements in the specification, unsupported by objective evidence, are insufficient to establish unexpected results."); *In re Lindner*, 457 F.2d 506, 508, 173 USPQ 356, 358 (CCPA 1972) ("[M]ere conclusory statements in the specification . . . are entitled to little weight when the Patent Office questions the efficacy of those statements.").

Here, Soni's specification contains more than mere argument or conclusory statements; it contains specific data indicating improved properties. It also states that the improved

properties provided by the claimed compositions "are much greater than would have been predicted given the difference in their molecular weights." The Board inferred from this statement a concession that a person of ordinary skill in the art would have expected a composition using a higher molecular weight polymer to yield better results than one using a lower molecular weight polymer. Further, while the Board accepted this part of the statement as true, it declined to accept the statement's conclusion that the improvements were much greater than would have been predicted. We think the Board read too much into the statement in concluding that it amounted to a concession that one skilled in the art would have expected improved properties. One can just as readily interpret the statement as meaning that one would not have expected the improvement that was realized, given the molecular weights, not that the improvement was expected. Moreover, it is illogical for the Board, without reason, to accept as true only that part of Soni's statement which supports the PTO's theory of unpatentability, while rejecting the remainder of the statement.

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The Board further stated that it could have taken judicial notice of the fact that higher molecular weight polymers would have been expected to tolerate higher filler loadings without degradation in properties and that it could have taken notice of the fact that it is the polymer *per se* that primarily determines the mechanical properties of a filled polymer composition. To support the latter principle, the Board cited a technical dictionary, which states that "[t]he polymer matrix primarily determines the mechanical properties of the composite system." The dictionary does not state, however, that *higher molecular weight* polymers form improved conductive polymer compositions. Thus, we find the Board's reliance on judicial notice to be no more convincing than its reliance on Soni's alleged admission.

[2] Mere improvement in properties does not always suffice to show unexpected results. In our view, however, when an applicant demonstrates *substantially* improved results, as Soni did here, and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence of* evidence to the contrary. Soni, who owed the PTO a duty of candor, made such a showing here. The PTO has not provided any persuasive basis to question Soni's comparative data and assertion that the demonstrated results were unexpected. Thus, we are persuaded that the Board's finding that Soni did not establish unexpected results is clearly erroneous.

The cases cited by the dissent are not to the contrary. Neither *De Blauwe*, nor *Wood*, nor *Lindner* requires a showing of unexpectedness separate from a showing of significant differences in result. Nor does *Merck*, which involved compositions understood to differ only in "a matter of degree." Those are not the facts here, where substantially improved properties were shown. Given a presumption of similar properties for similar compositions, substantially improved properties are *ipso facto* unexpected. The difficulty postulated by the dissent in distinguishing substantial from insubstantial improvement is no greater than the PTO and the courts have encountered, successfully, for many years in making judgments on the question of obviousness. It is not unworkable; it is simply the stuff of adjudication. Nor does it change established burdens of proof. The PTO here established a *prima facie* case,

the applicant responded to it with a showing of data, and the PTO made an inadequate challenge to the adequacy of that showing.

On appeal before us the PTO raises for the first time the argument that Soni's showing of unexpected results is not commensurate in scope with the claims. *See In re Dill*, 604 F.2d 1356, 1361, 202 USPQ 805, 808 (CCPA 1979) ("The evidence presented to rebut a *prima facie* case of obviousness must be commensurate in scope with the claims to which it pertains."). Here, claim 1 broadly encompasses all melt-processed compositions comprising a polymer having a molecular weight greater than 150,000. The proof of unexpected results, on the other hand, is limited to a single species within the claimed range, polyethylene having a molecular weight of 203,000. The same deficiency is said to apply to the dependent claims. Claim 6, for example, recites a composition in which the polymer is polyethylene having a molecular weight of 200,000 to 400,000.

[3] We will not consider this argument for the first time on appeal. *See De Blauwe*, 736 F.2d at 705 n.7, 222 USPQ at 196 n.7 ("[T]he Solicitor cannot raise a new ground of rejection or *apply a new rationale* to support a rejection in appeals from decisions of the board.") (emphasis added). Since the only rejection made and argued in the PTO was based on the asserted failure of the data concerning the 203,000 molecular weight composition to evidence unexpected properties, and we have concluded that that rejection was erroneous, we must reverse the rejection of all of the claims. If, following return of this case to the PTO, the PTO considers that a new obviousness rejection should be made of claims broad enough to encompass compositions that have not been held in this decision to have unexpected superiority, it is free to do so.

CONCLUSION

The Board's decision affirming the final rejection of claims 1-6, 8-12, and 21 is
REVERSED.

Footnotes

Footnote 1. The Rosenzweig and Soni patents are both continuations-in-part of U.S. patent application Serial No. 596,761, filed April 4, 1984, now abandoned.

Dissenting Opinion Text

Dissent By:

Michel, J., dissenting.

As the majority observes, the question presented by Soni's appeal is a narrow and factual one: namely, "whether the data in Soni's patent specification show that the compositions of the claims exhibit unexpectedly improved physical and electrical properties compared to lower molecular weight compositions." Slip op. at 6. I am unable to answer this controlling question in the affirmative. But, in reversing the Board's decision, the majority overturns a well-settled facet of the law of rejections for obviousness

by eliminating altogether one of the two requirements of a successful rebuttal case of unexpectedly improved results--namely, *objective* proof that the observed improvement was indeed unexpected. Having so amputated the applicable legal rule, the majority finds clear error where, applying precedent, I see no error at all. I therefore respectfully dissent.

DISCUSSION

According to Soni's specification, the claimed invention derives entirely from the "discover [y]" that use of "a melt-processable polymer having a molecular weight greater than 150,000" yields a conductive filler-polymer composition with "significantly improved physical and electrical properties, compared to those [made with] polymers of lower molecular weight, for the same filler loading." These improvements are, according to Soni, both "valuable and surprising."

The specification supports the assertion of significantly improved properties with data from a set of tests comparing two compositions. According to the specification,

A number of physical tests were carried out on samples of polyethylene to show the significant improvement in the physical properties that is [sic, are] observed at a molecular weight value of 150,000. Tensile tests, peel tests, resistivity behavior tests and recovery behavior tests were carried out. Each test was carried out on samples of Marlex HXM 50100 (Polyethylene, molecular weight 203,000, a composition according to the invention) and also on comparative samples of Marlex 6003 (polyethylene, molecular weight 148,000, outside the scope of the present invention).

After detailing the results of these comparative tests, the specification continues with the following, ostensibly summary, assertion:

The tensile, peel, resistivity behavior and recovery tests show significantly improved properties for a polymer having a molecular [weight] of 203,000 compared to one having a molecular weight of 148,000, which are much greater than would have been predicted given the difference in their molecular weights.

It is critically important to note that the final phrase of this sentence, an assertion made without objective support, is the *only* evidence Soni has *ever* offered to show that the variety of improvements observed in the change from a 148,000-molecular-weight to a 203,000-molecular-weight polymer were "much greater than would have been predicted" -- that is, were unexpectedly large. It is also important to note that the majority concedes that the data show the observed *degree* of improvement but not that the observed degree of improvement was *unexpected*. Slip op. at 8 (Soni indicates improvements by "specific data," but only "states" unexpectedness).

The examiner rejected Soni's claims as anticipated by or obvious from a number of prior art references, and the Board affirmed the rejection on obviousness grounds. During the course of its analysis, the Board focused on the specification's assertion "that the improvement in properties . . . was much greater than would have been predicted," but found the record devoid of any evidence to support that conclusion." The Board found that this statement, while some evidence of unobviousness, was clearly insufficient to outweigh the evidence of obviousness of record." It adhered to this view on reconsideration, observing that the only

evidence of unexpectedness Soni brought forward "consists of conclusory statements made in the original specification concerning unpredictable differences, which statements are unsupported by any factual data.

On appeal, Soni "concede [s] that the claimed invention would be *prima facie* obvious under 35 U.S.C. Section 103, but contend [s] that the evidence in the specification clearly rebuts the *prima facie* case and establishes the patentability of the claims." Soni's contention persuades me no more than it did the Board.

The applicable legal rules are both clear and longstanding. First, as we noted in *In re Oetiker*, [t]he *prima facie* case [of obviousness] is a procedural tool of patent examination, allocating the burdens of going forward as between examiner and applicant. . . . As discussed in *In re Piasecki* [, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984)], the examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability. If that burden is met, *the burden of coming forward with evidence or argument shifts to the applicant* ." 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992) (emphasis added) (citations omitted). Soni concedes that the examiner properly made out a *prima facie* case of obviousness, and thus concedes that it bore the burden of coming forward with evidence to rebut that case. Second, "whether [the applicant's] rebuttal evidence is sufficient to persuade the examiner that unexpected results exist is an evidentiary matter left for the trier of fact," *In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984), and

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reversed on appeal only where clearly erroneous, *In re Caveney* , 761 F.2d 671, 674, 226 USPQ 1, 3 (Fed. Cir. 1985). Far from clearly erring, the Board correctly evaluated Soni's rebuttal evidence, according to the controlling cases, as slight and insufficient.

One way for an applicant to satisfy the burden of coming forward with evidence to rebut the *prima facie* case of obviousness is to demonstrate that the claimed invention yields unexpected results. *In re Davies* , 475 F.2d 667, 670, 177 USPQ 381, 384 (CCPA 1973). As *In re Lindner* makes clear, the applicant's rebuttal evidence of unexpectedness must be objective:

The affidavit and specification do contain *allegations* that synergistic results are obtained with all the claimed compositions, but . . . mere lawyers' arguments unsupported by *factual* evidence are insufficient to establish unexpected results. Likewise, mere conclusory statements in the specification and affidavits are entitled to little weight when the Patent Office questions the efficacy of those statements. . . . [W]e agree with the board that there is insufficient evidence to overcome the case of *prima facie* obviousness found to exist here. 457 F.2d 506, 508-09, 173 USPQ 356, 358 (CCPA 1972) (emphasis added) (citations omitted). *See also In re De Blauwe* , 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) ("It is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice."); *In re Wood* , 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978) ("Mere lawyer's arguments and conclusory statements in the specification, unsupported by objective evidence, are insufficient to establish unexpected results."). *See also In re Carabateas* , 357 F.2d 998, 1001, 149 USPQ 44, 46-47 (CCPA 1966) (Rich, J., concurring in the judgment) ("[T]he art

makes no suggestion whatever that a reversal of the ester linkage would result in an increased activity *approximating the nineteen-fold increase found by appellant*. At the very best, the art suggests an increase of the order of four to eight times. . . . The question is not, it seems to me, whether the art suggests *an* improvement, but rather whether it reasonably suggests *the particular* improvement relied upon for patentability in both its qualitative and quantitative sense."). The majority acknowledges this principle but declines to apply it to the case at bar.

Soni failed to come forward with factual evidence tending to establish the unexpectedness of the observed degree of improvement in the claimed composition's physical properties, choosing instead to rely on the combined force of its data about the improvements and the subjective conclusory statement that such improvements "are much greater than would have been predicted given the difference in their molecular weights." The Board read this statement, quite naturally, as a concession that some *lesser* degree of improvement in properties would have been predicted from the difference in molecular weights alone, or, in the Board's words, as an "acknowledge [ment]" that "one of ordinary skill in the relevant art would have expected higher molecular weight polymers to result in better composition properties." 1 In light of the concession, the lack of objective evidence of the *unexpectedness*, as distinct from the magnitude, of the improvements proved fatal to Soni's appeal before the Board, just as cases such as *Lindner* require. The majority, however, now excuses Soni by eliminating the requirement that the improvement's unexpectedness be demonstrated objectively.

The majority claims that "the Board accepted this [concessionary] part of the statement as true, [but] it declined to accept the statement's conclusion that the improvements were much greater than would have been predicted," and then criticizes this reasoning as "illogical." Slip op. at 8, 9. There is nothing in the Board's opinion, however, to suggest that it failed to credit Soni with the statement's full worth -- namely, the worth of a candid report of Soni's sincere subjective belief that he would not have predicted the changes in properties that he observed on the basis of the difference in the polymers' molecular weights. Of course, such a conclusory statement reporting the inventor's subjective belief has virtually no worth at all as evidence of unexpectedness; despite the majority's appeal to them, Soni's actual candor is not doubted and his duty of candor is not relevant. Slip op. at 9. Our cases require objective rebuttal evidence of unexpectedness. Thus, far from falling prey to faulty

reasoning, the Board correctly found that Soni's conclusory statement regarding the unexpectedness of the improvements, however heartfelt, was "clearly insufficient to outweigh the evidence of obviousness of record." 2 Indeed, the Board's approach would have been proper even if Soni had never conceded that a lesser degree of improvement would have been predicted based on the change in molecular weights alone. Neither the specification nor any post-rejection submission contains objective evidence 3 tending to establish either (1) a baseline of expected improvements against which to measure the observed improvements, or (2) the lack of any such baseline expectation in the relevant prior art, as a result of which all degrees of improvement would be unexpected. Without establishing a baseline or the unavailability of one, however,

unexpectedness cannot be proved.

Our decision in *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986), illustrates the point. Merck was the assignee of a patent claiming a method of treating depression in humans comprising oral administration of amitriptyline, or its non-toxic salts, in a daily dosage of 25 to 250 milligrams. During reexamination, the examiner rejected the relevant claims on both anticipation and obviousness grounds, and the Board sustained the rejection for obviousness on review. The prior art taught, *inter alia*, that (1) amitriptyline is psychoactive, (2) imipramine, which differs from amitriptyline only in the replacement of the unsaturated carbon atom in its central ring with a nitrogen atom, is a highly effective antidepressant, (3) the replacement of the nitrogen atom in the central ring of a phenothiazine compound with an unsaturated carbon atom yielded a thioxanthene derivative with strongly similar pharmacological properties, and (4) imipramine and amitriptyline have a variety of similar pharmacological properties unrelated to the treatment of depression. *Id.* at 1094-95, 231 USPQ at 377-78. On appeal, we affirmed the Board's conclusion that "one of ordinary skill in the medicinal chemical arts . . . would have expected amitriptyline to resemble imipramine in the alleviation of depression in humans." *Id.* at 1097, 231 USPQ at 379. Merck contended, as it had before the Board, that amitriptyline had unexpectedly more potent sedative and anticholinergic effects than imipramine, supporting its contention with an affidavit from a professor of psychiatry and the published record of a symposium of physicians and psychiatrists concerned with the treatment of depression. *Id.* at 1098, 231 USPQ at 380. Both the affidavit and the symposium, however, merely noted the difference in effects between imipramine and amitriptyline without touching on the unexpectedness of the fact of or degree of difference. *Id.* We rejected Merck's theory, reasoning as follows:

The core of it is that, while there are some differences in degree between the properties of amitriptyline and imipramine, the compounds expectedly have the same type of biological activity. In the absence of evidence to show that the properties of the compounds differed in such an appreciable degree that the difference was really unexpected . . . appellants' evidence was insufficient to rebut the *prima facie* case. The fact that amitriptyline and imipramine, respectively, helped some patients and not others does not appear significant. As noted by the Board, a difference in structure, although slight, would have been expected to produce some difference in activity.

Id. at 1099, 231 USPQ at 381. In short, where an applicant fails to establish the relevant baseline according to which the Board can evaluate the unexpectedness of any observed improvements, he has failed to come forward with effective rebuttal evidence. It is true that *Merck* does not explicitly hold that unexpectedness must be proved *separately* by objective evidence. Nor do the earlier cited cases. But that, I submit, is their logic. Otherwise, an ostensibly two-part inquiry collapses in effect to a one-part inquiry.

According to the majority, "an applicant [who] demonstrates *substantially* improved results, as Soni did here, and *states* that the results were *unexpected* . . . establish[es]

unexpected results *in the absence* of evidence to the contrary." Slip op. at 9. This new rule for assessing an applicant's rebuttal evidence eliminates what I take to be the applicant's burden of coming forward with objective evidence of unexpectedness and thus directly

contradicts the holdings I discern from the controlling cases. Quite apart from the quick work it makes of cases such as *Lindner* and *Merck*, however, the majority's new rule may be inherently unworkable. For example, one may well ask how large improvements in results must be before the Board must consider them to be "substantially improved results" such that they amount to an effective rebuttal of a *prima facie* case of obviousness. The majority provides no guidance on the question, despite how critical it is to the workings of the new rule.

Perhaps the majority means to say little more than that, for claims drawn to polymer compositions, a 50-fold improvement in tensile strength after a 37% increase in the polymer's molecular weight requires the conclusion that the claimed invention is unobvious, limiting the effect of this case largely to the world of conductive polymer composition technologies. This reading would make the majority's decision relatively innocuous but all the more mysterious a departure from the two-part requirement of the governing cases. Or perhaps the majority means to say, more generally, that examiners, Board members, and Federal Circuit judges will know "substantial" improvements when they see them.

Disagreements among these evaluators are, of course, inevitable, and will likely be frequent. This reading, though less perplexing, would have far broader implications: unhindered by any objectively established baseline of expected improvement in the relevant art, the assessment of an applicant's unsupported assertion that the observed degree of improvement was unexpected can flex to suit the taste of the assessor, thus destabilizing the obviousness inquiry and virtually ensuring litigation through final appeal to us in most every case of allegedly unexpected improvement. The resulting loss of objectivity and predictability bodes ill for patentability determinations.

Similarly perplexing is the majority's reference to "*the absence of* evidence to the contrary." Slip op. at 9. First, this eliminates the *applicant's* obligation to come forward with evidence, the obligation that was the heart of the established rule. Second, it assumes that an unfair burden has been placed on the applicant. If the burden were one of persuasion, perhaps. But a mere burden of coming forward?

CONCLUSION

I question the desirability of the majority's new rule for assessing an applicant's rebuttal evidence of unexpectedness, according to which there need not be *any* objective evidence of unexpectedness other than the inventor's unsupported assertion that an artisan would not have expected so great an improvement in light of the changes made. Even if desirable, such a rule is certainly not the one our cases have established. Nor does the majority merely create an exception to the settled rule; it altogether abolishes the rule in favor of a "substantially improved results" standard that will often be met. Many cases will be decided differently in the future as a consequence.

Because of dramatic improvements here, the majority sets off on a dramatic departure from the law as it stood before this case, a departure I do not think it either explains or justifies. Nor will the new rule be easy to apply or predictable in its application. If the old rule is too harsh here, then at most a narrowly defined exception could perhaps be crafted. Instead, the majority upends settled law for all cases in all arts. Like the Board, I would follow the rule of cases such as *Merck* and *Lindner* and would thus affirm the Board's rejection of Soni's application.

Footnotes

Footnote 1. Indeed, Soni continued to make this same concession on appeal before us, albeit implicitly. *See, e.g.* , Reply Brief at 4-5 ("As to the results which would be expected with polymers of molecular weight less than 203,000, one of ordinary skill in the art, having learned of the surprising good results provided by a molecular weight of 203,000 as compared to a molecular weight of 148,000, and knowing that molecular weight is a continuously variable quantity, would expect that the improvements would continue to be observed as the molecular weight was reduced below 203,000, by a degree which was diminishing, but nonetheless surprising.").

Footnote 2. One might also note that even if, as the majority claims, the Board had "accept[ed] as true only that part of Soni's statement," slip op. at 9, the Board would not thereby have violated any principle of logic. Rather, it would have been obeying principles of experience. Soni's concession was a statement against its own proprietary interest and thus more likely to be true. *See* , *e.g.* , Fed. R. Evid. 804(b)(3) ("statement against interest" exception to the rule against hearsay). The latter part of the statement, by contrast, was completely self-serving and thus less likely to be true.

Footnote 3. I do *not* understand the requirement that the evidence be objective to require that it be numerical. In other words, quantitative tests, by the applicant or in the prior art, are not the *sine qua non* of objectivity; to be objective, the evidence must justify, rather than merely report, the subjective experience of surprise at an observed degree of improvement.

- End of Case -